In The Claims

Claims 56-91 are pending in the application with claims 56, 61, 62, 67, 68, and 73-75 amended herein.

Claims 1-55 (canceled)

56. (currently amended) A method comprising:

forming a material over a substrate;

oxidizing only a first portion of the material; and

separately from ~~the~~ oxidizing the first portion, converting at least a part of the oxidized first portion to a perovskite-type crystalline structure; and

separately from the converting, oxidizing a second portion of the material beneath the oxidized first portion.

57. (currently amended) The method of claim 56 wherein the substrate comprises a capacitor electrode and the converted, oxidized ~~material~~ first portion comprises a capacitor dielectric layer.

58. (previously presented) The method of claim 56 wherein the material comprises an alloy of at least two metals.

59. (previously presented) The method of claim 58 wherein at least two of the metals exhibit a substantial difference in chemical affinity for oxygen.

60. (previously presented) The method of claim 56 wherein the oxidizing only the first portion occurs in situ with the forming the material.

61. (currently amended) The method of claim 56 wherein the converting comprises heating the oxidized ~~material~~ first portion and reaching a maximum temperature no more than about one-half of a melting point temperature of the perovskite-type ~~material~~ crystalline structure.

62. (currently amended) A method comprising:

depositing a material containing at least two metals and having a thickness of from about 3 to about 30 nm over a substrate in a vacuum chamber at less than atmospheric pressure;

oxidizing the material in a vacuum chamber at less than atmospheric pressure; and

separately from the oxidizing, converting at least a portion of the oxidized material to a perovskite-type crystalline structure.

63. (previously presented) The method of claim 62 wherein the oxidizing comprises forming a plasma while flowing oxygen into the vacuum chamber held at a pressure of from about 2 to about 50 microns of Hg.

64. (previously presented) The method of claim 62 wherein the substrate comprises a capacitor electrode and the converted, oxidized material comprises a capacitor dielectric layer.

65. (previously presented) The method of claim 62 wherein the material comprises an alloy of at least two metals.

66. (previously presented) The method of claim 65 wherein at least two of the metals exhibit a substantial difference in chemical affinity for oxygen.

67. (currently amended) The method of claim 62 wherein the converting comprises heating the oxidized material and reaching a maximum temperature no more than about one-half of a melting point temperature of the perovskite-type ~~material~~ crystalline structure.

68. (currently amended) A method comprising:

forming a material containing at least two metals and having a thickness of from about 3 to about 30 nm over a substrate;

oxidizing the material and implanting oxygen ions into the material; and

separately from the oxidizing, converting at least a portion of the oxidized material to a perovskite-type crystalline structure.

69. (previously presented) The method of claim 68 wherein the oxidizing comprises oxidizing at least an outer portion of the material, the implanting comprises implanting oxygen ions into the outer portion, and the converting comprises converting at least a part of the oxidized outer portion to a perovskite-type crystalline structure.

70. (previously presented) The method of claim 68 wherein the substrate comprises a capacitor electrode and the converted, oxidized material comprises a capacitor dielectric layer.

71. (previously presented) The method of claim 68 wherein the material comprises an alloy of at least two metals.

72. (previously presented) The method of claim 71 wherein at least two of the metals exhibit a substantial difference in chemical affinity for oxygen.

73. (currently amended) The method of claim 68 wherein the oxidizing the ~~outer portion~~ material comprises exposure to an oxygen plasma.

74. (currently amended) The method of claim 68 wherein the oxidizing the ~~outer portion~~ material and the implanting together comprise exposure to an oxygen plasma.

75. (currently amended) The method of claim 68 wherein the converting comprises heating the oxidized material and reaching a maximum temperature no more than about one-half of a melting point temperature of the perovskite-type ~~material~~ crystalline structure.

76. (previously presented) A method comprising:

forming a material over a substrate;

oxidizing the material;

forming a passivation layer over the material;

separately from the oxidizing, converting at least a portion of the oxidized material to a perovskite-type crystalline structure.

77. (previously presented) The method of claim 76 wherein the forming the passivation layer occurs in situ with the forming the material.

78. (previously presented) The method of claim 76 wherein the forming the passivation layer occurs in situ with the oxidizing the material.

79. (previously presented) The method of claim 76 wherein the oxidizing the material comprises oxidizing only a first portion of the material, the method further comprising oxidizing the passivation layer and thereafter oxidizing a second portion of the material.

80. (previously presented) The method of claim 79 wherein the oxidizing a second portion of the material occurs in situ with the oxidizing the passivation layer.

81. (previously presented) A method of making a semiconductor device comprising the steps of:

vacuum depositing an inner layer comprising an alloy of at least two metals, the vacuum depositing occurring over an inner capacitor electrode in a processing device comprising one or more chambers;

oxidizing a first portion of the deposited inner alloy layer with an oxygen plasma and implanting oxygen ions into the deposited inner alloy layer, the oxidizing and the implanting occurring at a first temperature in the processing device after the vacuum depositing but before removal from the processing device;

vacuum depositing a passivation layer over the inner alloy layer;

oxidizing the passivation layer to form an outer dielectric layer;

oxidizing a second portion of the deposited inner alloy layer; and

separately from the oxidizing the first and second portions, heating the oxidized inner alloy layer to convert at least a portion of the oxidized inner alloy layer to a perovskite-type crystalline structure, such heating reaching a second temperature greater than the first temperature but no more than about one-half of a melting point temperature of the layer portion having the perovskite-type structure.